Biomark 601 Handheld Reader
User Manual

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Introduction

Thank you for purchasing the Biomark 601 Handheld reader. This is an extremely functional, durable and water resistant reader. It has many options for configuration that make it very versatile. The reader also has an excellent read range with Biomark tags that make it ideal for most "mark-recapture" applications.

Note: Biomark recommends installing AA batteries or charging the included NiMH rechargeable batteries before using your reader (see page 5).

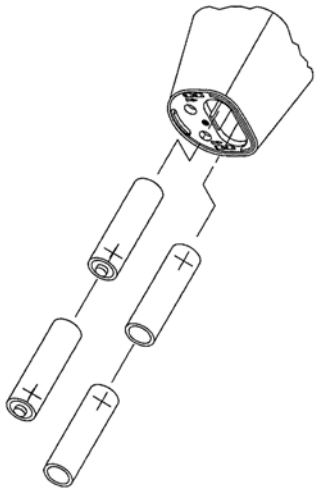
Biomark 601 Components

The RS601-3 includes the following components:

- Handheld Reader w/wrist strap
- Biomark Manual
- AA batteries, pack of 4
- Rechargeable NiMH batteries, pack of 4
- 120/VAC/60 Hz battery trickle charger
- End-cap with AC Power/Comm Cable
- Additional end cap 'O' ring

Battery Installation Guide

For detailed instructions please see page 5.



Reader Overview

Feature/Item	Description of Use
READ Button	Turns Reader ON from OFF state Activates transponder reading from ON state Selects certain option alternatives in Options Menu
MENU Button	Activates Options Menu / Selects Options Menu Category
SCROLL UP/DOWN Buttons	Navigates Options Menu (Press both buttons simultaneously to turn off unit)
2x8 Character LCD	Displays transponder ID Code information, Reader status, and Options Menu selections
Red LED Indicator	Lights when valid transponder ID Codes are detected (optionally lights with Options Menu selections)
Scan Face	Reader surface planar with scanning coil. Transponder coil axis should be perpendicular to Reader scan face for maximum reading distance
Handle	Ambidextrous gripping surface
End Cap	User removable component for accessing battery compartment
End Cap Screw	Retains End-cap in place
Attachment Pin and Ring	Used to attach wrist strap, belt hook, etc.
Data/Power Cable	Connects Reader to PC and battery charger (not shown)
Battery Compartment	Accepts 4 AA alkaline or 4 AA rechargeable batteries (not shown)
Data/Power Connectors	Data/Power Cable End-cap connectors interface (not shown)
Equipment Label	Provides model, serial number, and agency certification notices

Reader Setup

The Portable Reader is shipped with the wrist strap end-cap installed. In order to prepare the Reader for use, 4 AA batteries (either alkaline or the included NiMH rechargeable) must be installed. The rechargeable batteries are shipped in a discharged state, and must be fully charged prior to reader use.

Caution: Do not attempt charging alkaline batteries, and do not combine alkaline and rechargeable batteries, or combine different rechargeable battery types. Serious damage will result and void the warranty.

Battery Installation Instructions

Unscrew the end-cap fastener by turning it counter-clockwise approximately 5 complete turns (finger tighten only, do not use tools). Remove the end-cap by pulling it away from the Reader's handle.
Install the alkaline batteries or rechargeable batteries, observing the polarity orientation icons located beneath the battery channel.

Note: Incorrect installation of the batteries will not damage the reader. However, the Reader will fail to operate unless the batteries are correctly oriented. Small icons engraved near the battery compartment indicate battery orientation.
Note: Biomark recommends removing the batteries, wiping down the reader and storing in a dry place upon return from the field.

Reposition the end-cap on the handle end, guiding the connector plugs into their respective receptacles (if the end-cap is so equipped), and tighten the end-cap fastener by turning it clockwise about 5 complete turns until fully seated.

Charging the NiMH Batteries

If rechargeable batteries have been installed in the Portable Reader, remove the endcap and install the AC Power/Comm Cable endcap (this endcap also doubles as a trickle charger for the rechargeable NiMH batteries). Plug the battery charger into a power outlet and connect the DC output plug to the mating receptacle on the AC Power/Comm cable. The batteries must be charged for 12 to 16 hours from a completely discharged state. The trickle charger may be left connected to the Reader continuously when the Reader is being used with the data/power cable end-cap. Overcharging of the battery pack will not occur.

Powering the Reader with AC Power

To power the reader continuously, install the AC Power/Comm cable endcap and plug the DC output plug into the mating receptacle (the same procedure for charging the NiMH batteries). Operating the reader in this matter will not harm the batteries, however, they should be recharged before going into the field.

Note: If you want to run the reader continuously with AC power, under the Reader Settings Option Category, set the Time On to "Timeroff" (see page 8) so the reader will not automatically shutdown after the default setting of 30 seconds. Be sure to reset this when you go back into the field to prolong battery life.

Getting Started

Turning the Reader On

After installing the batteries (and charging if rechargeable batteries are being used) or making the necessary AC power/comm. cable connections, the Biomark RS601-3 Handheld is ready for operation.

The Portable Reader is activated from its normally OFF state by momentarily pressing the READ button for at least ½ second. Upon depression of this button, the Reader is turned ON, and an indication of this state is enunciated by momentary flashing of the Red LED visual indicator and beeping of the audible indicator. The LCD will immediately display either the last tag read (if this has been selected in the option menu) or will display "Reader Ready", indicating that the Reader is powered and ready to scan for tags.

If the batteries exhibit a low charge level at power up or when the Read button is subsequently pressed for scanning a tag, the LCD will exhibit "Low Battery", and the Reader may automatically power off.

Reading Tags

Prior to use each time, Biomark recommends that the reader be checked with the test tag provided with the reader. This will ensure that the unit is working properly and that the desired read distance will be attained.

Tag Orientation - Maximum read distance is attained when a tag is in best orientation (when the tag is perpendicular to the face of the reader). Worst orientation of a tag is attained when the tag is parallel to the face of the reader.

Tag Quality - Biomark sells the highest performing tags for the fish and wildlife research community available. Biomark cannot guarantee the performance of other manufacturers tags.

Electrical Noise Interference - Read range can be affected by electromagnetic interference, such as overhead lights, computer monitors and overhead power lines. Large amounts of ferrous material, such as a metal pipe, rebar in concrete or a metal desk will also affect read range.

Configuring the Biomark 601 Reader

This section will discuss the configuration of the Biomark 601 reader. To begin, use the bullet points below to familiarize yourself with accessing and manipulating the reader menu.

- **Press the menu button to access the 7 different reader Option Categories**
- **Use the Scroll Up/Down buttons to navigate each option category**
- **Use the read button to select/change desired setting**

Below each Option Category is described in detail…
* = Denotes default setting

Display Setup

#Format

Options: Hex or *Dec (for 134.2 kHz tags only)

Hex: The reader will display the tag code in a 14 digit hexadecimal format (i.e. $3D9_H$ $1C2C4E2CB1_H$). Hexadecimal format includes the letters A through F as well as numbers 0 through 9.
Dec: The reader will display the tag code in a 15 digit decimal format (i.e. 985 121002405041). Decimal format uses only numbers.

To ensure that the tag codes show up in the same format when downloaded, make sure these same options are selected in the ID Code Format menu (see page 10).

Lead 0's

Options: *Yes or No

This option is an artifact dating back to the reader's introduction when our PIT tag numbers commenced with low numbers. For example, 982 000000012345. Suppressing the leading 0's makes the LCD produce 982 12345, making the display somewhat easier to read. When tags start with a non-zero character, such as 982 100023456789, either setting results in the same display.

Last Tag
Options: *On or Off

On: The reader will display the last tag read upon powering up.
Off: The reader will not display the last tag read upon powering up.

Cty Code
Options: *Alp or Num

This option makes the first 3 digits appear as either the ISO 3166 number sequence or alpha sequence, but has no affect on tags coded with manufacturer numbers such as 900, 982 or 985.

F/H/A
Options: Yes or *No

Yes: Denotes the frequency of tag read. When a tag is read, F (denoting Full Duplex B, 134.2 kHz), a highlighted F will show behind the 3rd character of the tag code. For example: 982**F**100023456789. H is for Half Duplex tags. An A (denoting Full Duplex A, 125kHz), FDXA will show up at the beginning of the tag code. For example: **FDXA**43253764404.
No: No frequency denotation will be displayed.

Reader Settings

Menu Beep
Options: *Every or First

Every: Reader beeps with every tag read
First: Reader beeps only on the first time a tag is read if the same tag is read twice or more in a row.

Auto Read
Options: On or *Off

On: The reader will power up in scanning mode.
Off: The reader will power up in idle mode, displaying the last tag code read (if this option is on).

Wrls Sync
Options: On or *Off

When this function is on, it ensures the reader will not interfere with a nearby fixed reader/antenna system. This option is designed mainly to eliminate interference for HDX (half-duplex) systems.

Time On
*0:30 min

Allows the user to select the shut down time for the reader. Options are from 20 seconds to 4 minutes. Selecting TIMEROFF will allow the user to run the reader continuously with out the unit turning off.

Read Time
*3 sec

Sets the amount of time the reader searches for a tag, from 1 second to 9 seconds (hold down for continuous read).

Time & Date

Date Fmt
*DD MM YY

Sets the date format to 18/01/11. Other options are MM DD YY, YY MM DD.

To ensure that the date and time are included when downloading tag codes, make sure the TimeDate option is set to On under the ID Code Format menu (see page 10).

Date Sep
*/ Slash

Sets the / as the separator for example 18/11/11. Other options are . (18.01.11) or - (18-01-11). This is the format the date will be displayed when the tag-codes are downloaded.

Date

Displays the current date that has been selected, for example 18/10/11. The date can be changed in this screen by using Read button to and the Scroll Up/ Down button.

Time Fmt
Options: *12 or 24

12: Standard 12 hour (AM/PM) time format.
24: Military or 24 hour time format.

Time

Displays the current time that has been selected, for example PM 04:54:37. The time can be changed in this screen by using Read button to and the Scroll Up/Down button.

Stored ID Tags

Xxxx IDs Stored

Displays the number of tag codes currently stored in the readers memory. Pushing the read button allows tag codes to be downloaded.

Delete

Options: Yes or *No

Yes: Deletes all tag codes stored in the reader's memory.
No: Retains all tag codes stored in the reader's memory.

Stored ID Codes

Allows the user to scroll through the current tags stored in the readers memory. Pressing the Read button will send the displayed tag code to the comm. port if the reader is hooked up to and communicating with a computer (see page 14).

RS232 Settings

Your reader should display these default settings for communicating with a computer to download tag codes (see page 14).

Bit Rate

*9600

Sets serial port bit rate, 9600 is standard.

Data Bits

*8

Sets data bits per character, 8 is standard.

Parity

*None

Sets parity mode, None is standard.

Flow Cntl
Options: On or *Off

Sets Flow Control, standard is Off.

ID Code Format

#Format
Options: Hex or *Dec

Hex: When downloaded the tag code will show up in a 14 digit hexadecimal format (i.e. $3D9_H$ $1C2C4E2CB1_H$). Hexadecimal format includes the letters A through F as well as numbers 0 through 9.
Dec: When downloaded the tag code will show up in a 15 digit decimal for mat (i.e. 985 121002405041). Decimal format uses only numbers.

Cty Code
Options: *Alp or Num

When tag codes are downloaded, this option makes the first 3 digits appear as either the ISO 3166 number sequence or alpha sequence, but has no affect on tags coded with manufacturer numbers such as 900, 982 or 985.

Lead 0's
Options: *Yes or No

This option is an artifact dating back to the reader's introduction when our PIT tag numbers commenced with low numbers. For example, 982 000000012345. Suppressing the leading 0's makes the LCD produce 982 12345, making the display somewhat easier to read. When tags start with a non-zero character, such as 982 100023456789, either setting results in the same display.

Duplicts
Options: Yes or No

Yes: When hooked up to a computer, a tag read repeatedly will be sent each time it is read.
No: When hooked up to a computer, a tag read repeatedly will only be sent once.

Note: A tag read multiple times in a row, will only show up once when downloaded. Only when another tag is read and then the initial tag read again, will it be downloaded twice.

TimeDate

Options: Yes or *No

Yes: Downloaded tag codes will have a date and time associated with them.
No: Downloaded tag codes will not have a date and time stamp associated with them.

Rsrv Fld

Options: On or *Off

Suppresses ISO Reserved field.

DB Flag

Options: On or *Off

Suppresses ISO Data Bit flag.

C/M Code

Options: On or Off

On: The country/manufacturer code will be included with the tag code when downloaded (for example the 900, 982 or 985).
Off: The country/manufacturer code will not be included with the tag code when downloaded.

Delimiter

Options: *Space, None, . , Tab, ; or ,

Sets the character that is displayed between the data fields (tagcode, date and time), when tags are downloaded. Default is '.'

1st Char

Sets first character transmitted.

Tag Type

Sets character fields.

Reader Info

Info

Options: SW Vx.xx or HW Vx.xx

SW V1x.xx: where x denotes the software version of the reader.
HW Vx.xx: where x denotes the hardware version of the reader.

Downloading Tag Codes

Biomark 601 Reader Communication Settings

Make sure the following menu options (under the RS-232 Settings Category) are set on your Biomark 601 reader: COM 1, 9600 Baud, 8 Data Bits, No Parity, Flow Control None.

Downloading Data Using the Biomark Tag Manager Software

First, ensure that the Biomark Tag Management Software is installed correctly on your system and that your 601 reader is powered on. On the reader setup screen, select the appropriate COM Port from the drop down menu. Most computers have only one COM Port, which usually defaults to COM1.

*If you do not see the correct port listed, choose Refresh at the bottom of the drop down menu. If it still does not appear, there is a problem with your connection.

Once you have the COM Port selected, find and select "Biomark 601" from the Reader Model drop down menu. When the COM Port has been and the Reader Model have been selected, the Reader Name box should populate (e.g. Biomark 601 @ COM1). Finally, click the Verify Reader Connection button and the red circle next to the Reader Name box will turn green. The green circle indicates that the computer is successfully communicating with your Biomark 601 Reader. Now that you are connected, you may download your tag codes directly to Excel or scan tag codes Real Time into Excel. To purchase the Biomark Tag Manager Software, please contact us at 208-275-0011 or customerservice@biomark.com.

*Please refer to the Biomark Tag Manager Software manual for further details and troubleshooting.

Downloading Data Using the Biomark BioTerm Software

BioTerm is a terminal program that Biomark has developed to replace the aging HyperTerminal program. It can be downloaded at no cost at www.biomark.com.

First, ensure that the Biomark BioTerm Software is installed correctly on your system and that your 601 reader is powered on. Select the appropriate COM Port from the drop down menu next to 'Serial Port'. Most computers have only one COM Port, which usually defaults to COM1.

*If you do not see the correct port listed, choose Refresh to the right of the menu. If it still does not appear, there is a problem with your connection.

Once you have the COM Port selected, ensure that your baud rate is 9600 (or matches the baud rate you have selected within your readers settings). Select whether or not you want to use the Text Capture function, and then select Open. The traffic box below should turn white (message will appear if you a connection is not established and will let you know what went wrong). Press 'G' to download all tags from the units memory.

Biomark 601 Reader Technical Specifications

RFID Compatibility:	ISO 11784 & 11785 HDX and FDX-B and Fecava FDX-A
Form Factor:	Portable Handheld Santoprene Enclosure
User Interface:	Single "On/Press to Read" Activation Button Menu & Scroll Up/Down Option Select Buttons 16 character (2x8) LCD display Audible Beeper and Red LED "Read" Indicators
ID Code Display Format	Decimal or Hexadecimal
Clock/Calendar	ddmmyy and hh:mm:ss (12 or 24 hour format)
Memory:	1600 ID codes (including Mfr Code and date/time)
Battery Power:	4 AA Alkaline battery cells, or 4 AA NiCad or NiMH rechargeable battery cells
Electromagnetic Compatibility (EMC) Certifications	FCC Part 15 Class A CISPR 22 (EN55022), and EN50082-1 ETSI 300 330-1 Industry Canada RSS-210

PHYSICAL/ENVIRONMENTAL

Dimensions:	275 mm L x 68 mm W x 83 mm H
Weight:	Approx 0.35 kg. with alkaline battery installed
Enclosure Material:	Monsanto Santoprene ®
Color:	Medium Gray (Pantone 423C)
Operate Temperature	+5ºC to +40ºC (IEC68.2.1/.2)
Storage Temperature	-10ºC to +55ºC (IEC68.2.1/.2)
Humidity:	0 to 95% (IEC68.2.56)
Altitude:	-100 to +3,000 meters
Mechanical Shock:	Per IEC 68-2-27
Vibration:	Per IEC 68-2-6
Hermeticity:	IP-68 to 1 meter immersion per IEC 529
Buoyancy:	Approximately ½ the weight of water it displaces
Chemical Resistance:	Resistant to petroleum based solvents & fluids, biological and organic fluids, aqueous solutions, and mild acid/alkaline solutions

RELIABILITY

MTBF:	50,000 hours
MTTR:	0.5 hours
Expected Life:	5 years, minimum

PERFORMANCE

Read Distances:	HPT8	3.5-5 inches
	HPT9	3-5 inches
	HPT12	5-7 inches
	HPT22	7-11 inches
	FDX-A	5-8.5 inches
Reading Orientation:	0º to 30º with less than 10% range decrease	
Read Error Rate:	Less than 1 in 10^6	
Read Cycles/Battery:	5,000 - Alkaline (disposable) (based on 2 second read intervals 2,500 - NiCad (rechargeable) 5,000 – NiMH (rechargeable)	

Biomark Inc. Warranty Statement

Biomark Inc. warrants that each Part or Equipment is free from defects in materials and workmanship. The warranty period for a Parts and Equipment is 12-months from your date of purchase. A valid proof of purchase may be required. If you do not have a valid proof of purchase, the warranty period will be measured from the date of sale from Biomark Inc. or its Distributor.

If, during the warranty period, the Part or Equipment is not in good working order, Biomark Inc. will, at its option, repair or replace it at no additional charge.

After replacement or repair the original part or equipment will be the originating term of the warranty. The warranty does not extend to cover the repaired or replaced part or equipment. Biomark, Inc. is predominantly a reseller of parts and equipment. All parts that are manufactured by someone other than Biomark, Inc. are subject to the Manufactures warranty.

Extent of Warranty
The warranty does not cover the repair or exchange of a Part or Equipment resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance, or failure caused by a product for which Biomark Inc. is not responsible. The warranty is voided by removal or alteration of Parts or Equipment identification labels.

Warranty Service
Warranty service may be obtained from Biomark Inc., headquartered in Boise, Idaho, by receiving a Return Material Authorization number during the warranty period. You may be required to present proof of purchase or other similar proof of warranty entitlement. You are responsible for any associated transportation charges, duties and insurance between you and the Biomark Inc. facility. Biomark, Inc. will ship repaired or replacement parts and equipment Duty Prepaid (DDP) and will pay for standard return shipment.

WARRANTY SERVICE FOR INSTALLED PARTS AND EQUIPMENT

Biomark warrantees' parts and equipment of installed systems for one year from date of delivery to the customer. When a warranty issue on equipment or parts arises within the Biomark warranty (12 months), the customer can request a quote for repair of equipment on site or the customer can return the parts or equipment to Biomark, Inc. facility through the "Warranty Service" statement above.

Regulatory Notices

FCC ID: NQY-930043

Note: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and the receiver.
Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
Consult the dealer or an experienced radio/TV technician for help.

THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

This device has been tested and meets the Electromagnetic Compatibility (EMC) requirements of EMC Directive 2004/108/EC and R&TTE Directive 99/5/EC.

Use of this device is protected under patent no. US 7,528,725 B2.

RBRC™ Battery Recycling Program

This product uses nickel-cadmium (ni-cad) rechargeable and recyclable batteries. When the batteries no longer hold a charge, they should be removed and recycled. They must NOT be incinerated or composted. In some venues, it is illegal to place depleted batteries in municipal solid waste. Many battery retailers participate in the RBRC™ (Rechargeable Battery Recycling Corporation) program. For further information consult www.rbrc.org.

Note: The 230 VAC/50 Hz Battery Charging unit is equipped with electrical fuses for safety. If it becomes necessary to replace these fuses, use identical type T500 / 230 VAC / 5 x 20 mm compliant fuses only.